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conductor,, nor is decomposed, or against water (231), which is a conductor, and can be decomposed,—as well as against the metal poles,, which are excellent conductors, but undecomposable, there appears but little reason to consider the phenomena generally, as due to the *attraction* or attractive powers of the latter, when used in the ordinary way. since similar attractions can hardly be imagined in the former instances.

234. It may be said that the surfaces of air or of water in these cases become the poles, and exert attractive powers'; but what proof is there of that, except the fact that the matters evolved collect there, which is the point to be explained, and<sup>1</sup> cannot be justly quoted as its own explanation? Or it may be said, that any section of the humid conductor, as that in the present case, where the solution and the water meet, may be considered as representing the pole. But such does not appear to me to be the view of those who have written on the subject, certainly not of some of them, and is inconsistent with the supposed laws which they have assumed, as governing the diminution of power at increased distances from the poles.

235. Grotthuss, for instance, describes the poles as centres of attractive and repulsive forces (217), these forces varying inversely as the squares of the distances, and says, therefore, that a particle placed anywhere between the poles will be acted upon by a constant force. But the compound force, resulting from such a combination as he supposes, would be anything but a constant force; it would evidently be a force greatest at the poles, and diminishing to the middle distance. Grotthuss is right, however, *in the fact*, according to my experiments (238, 241), that the particles are acted upon by equal force—everywhere in the circuit, when the conditions of the experiment are the simplest possible; but the fact is against his theory, and is also, I think, against all theories that place the decomposing effect in the attractive power of the poles.

236. Sir Humphry Davy, who also speaks of the *diminution*

of power with increase of distance from the poles '  
(219), supposes  
that when both poles are acting on substances  
to decompose  
them, still the power of decomposition *diminishes*  
to the middle  
distance. In this statement of fact he is  
opposed to Grotthuss,  
and quotes an experiment in which sulphate of  
potassa, placed  
at different distances from the poles in a humid  
conductor of  
constant length, decomposed when near the pole,  
but not when;  
at a distance. Such a consequence would  
necessarily result

<sup>1</sup> *Philosophical Transactions*, 1807, p. 42.